

Einhorn (Max)

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BY

MAX EINHORN, M.D.

PHYSICIAN TO THE GERMAN DISPENSARY, NEW YORK



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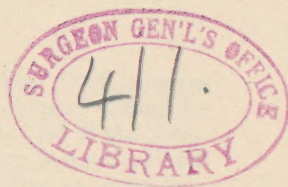
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## A NEW METHOD OF OBTAINING SMALL QUANTITIES OF STOMACH CONTENTS FOR DIAGNOSTIC PURPOSES.<sup>1</sup>

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MR. PRESIDENT AND GENTLEMEN: The chief progress made in the branch of diseases of the stomach during the last two decennials lies especially in the field of the chemical condition of the stomach. Nothing is more rational than to examine the work accomplished by an organ in a diseased condition. It is now possible to determine, almost with certainty, by exact examination of the stomach contents, whether the stomach delivers its juices normally or not. The determination of free hydrochloric acid here plays a main rôle, for it forms one of the most important products of the stomach secretion. As is well known, the stomach contents are obtained by means of a tube and Ewald's "expression method."

Notwithstanding the great importance of the results obtained by a chemical analysis of the stomach contents—still this new method has as yet not generally been used by the medical profession. On the one hand an exact chemical analysis of the stomach contents absorbs too much time, and on the other the examination by means of the tube is often unpleasant and difficult both for the patient and even for the physician. Therefore any method which aims at rendering less difficult, even in a small degree, the examination of the stomach-contents, must be welcome to the practitioner, even should there be lost by this method some of the minor details; for it

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<sup>1</sup> Read and demonstrated in the Section on Practice of the New York Academy of Medicine, May 20, 1890.

is certainly better to have something objective, than to be merely dependent upon the subjective complaints of the patient.

Having these points in view, Guenzburg<sup>1</sup> tried to avoid the introduction of the stomach tube. This author, in 1889, had his patient swallow potassium iodide enclosed in small rubber bags and fastened by fibrine threads. After the disappearance of the fibrine by digestion the rubber bag opens and the potassium iodide can now be absorbed. As soon as iodine is detected in the saliva, we are sure that the fibrine has been digested, and from this Guenzburg concludes the presence of hydrochloric acid. But this method, though ingenious, is not adapted for practical purposes. For, on the one hand, it causes the necessity of examining the saliva for quite a period of time (one to two hours); on the other, the appearance of iodine in the saliva does not conclusively prove that the fibrine has been digested in the stomach. The rubber bag may have escaped from the stomach into the intestines, the fibrine may have been digested there, and the potassium iodide absorbed. Thus we cannot make any decided conclusion as to the stomach-secretion by this (Guenzburg's) method.

Another simple method originated with Edinger.<sup>2</sup> This author already, in 1881, fastened a small sponge to a silk thread, which he caused his patient to swallow. After several minutes he took the sponge out of the stomach of his patient and examined the expressed contents of the sponge for hydrochloric acid. But Edinger's sponge-method lacks in the following two points: Firstly, the sponge is partly expressed during its withdrawal through the narrow points (cardia and introitus œsophagi), and thus loses much of the obtained stomach-contents; secondly, it absorbs fluid from the moisture of the œsophagus and pharynx. Thus the few remaining drops of

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<sup>1</sup> Guenzburg, A. : Deutsche medicin. Wochenschr., 1889, No. 41.

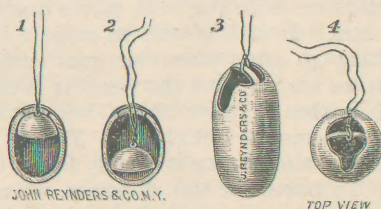
<sup>2</sup> Edinger, L. : Deutsche Arch. f. klin. Med., Bd. 29, p. 555.



stomach-contents in the sponge are obtained impure (*i.e.*, mixed with other fluids), and sometimes are changed in their chemical condition.

In order to avoid these drawbacks I devised this little instrument, which I shall have the pleasure of showing to you this evening.

My original idea was to construct the apparatus in such a way that it would enter the stomach closed, there open, be filled with the contents, and would again close while withdrawing it. For this purpose I have simply put two hemispheres into each other in such a way that the external occluding hemisphere, though larger, had a smaller opening diameter than the occluded hemisphere. To the



occluded hemisphere a thread is fastened. As long as the apparatus hangs on the thread the small hemisphere occludes the orifice of the larger one, and the apparatus remains closed (Fig. 1). As soon as the apparatus comes into the stomach and swims in the fluid, the lid must by its gravity fall down, and in this way the apparatus opens, and any fluid of the stomach can flow into it (Fig. 2). When taking the apparatus out by pulling the thread, the lid closes the aperture immediately. Here are two apparatuses constructed upon this principle. But I regret to state that they did not prove practical, for the reason that the opening is too small and the fluid cannot enter into the apparatus freely enough. I therefore decided to omit the lid altogether.

The apparatus which proved to be perfectly adapted

for obtaining small quantities of the stomach-contents, and which I have the pleasure of presenting to you now, consists of a small oval vessel ( $1\frac{3}{4}$  ctm. long,  $\frac{3}{4}$  ctm. wide) made of silver; on the top of the same there is a large opening with an arch over it; on this arch a silk thread is tied (Fig. 3).

**Method.**—In order to obtain a sample of the stomach-contents, one proceeds in the following way. The patient is asked to open his mouth widely and the little vessel is placed on the root of the tongue (almost in the pharynx); the patient is now to swallow *once*. The vessel comes after a short time (one-half to one and one-half minute) into the stomach. This point can be easily found by the length of the thread from the vessel to the mouth; it equals the distance from the teeth to the cardia, which is usually 40 ctm. It is advisable to make a knot on the thread marking 40 ctm.; when this knot comes into the mouth, then we are sure that the vessel is in the stomach. The vessel is then left for about five minutes in the stomach and thereupon withdrawn. During withdrawal of the apparatus a resistance is usually felt at the introitus cesophagi. To overcome this difficulty, when the apparatus is at that narrow point the patient should either deeply expire or swallow *once*. By the act of swallowing the larynx is pushed forward and upward, and thus the passage is free.

If the stomach is not empty, the vessel returns filled, and the amount is sufficient for making qualitative tests for free hydrochloric acid and the rennet ferment. This little apparatus may be called a "stomach-bucket."

In people suffering from an abundant secretion of the mucous membranes it might happen that the little vessel becomes filled with mucus before entering the stomach. [In emptying the vessel, it is always easy to distinguish real stomach-contents (namely chyme) from plain mucus.] In case we find principally mucus in the vessel, it is necessary to make the trial again and to cover the opening with a thin gelatinous capsule, which keeps the mucus



away from the vessel on its passage to the stomach ; there the capsule is dissolved, and the stomach-contents can now enter into the apparatus.<sup>1</sup> On its return from the stomach, the "bucket" being filled, the mucus cannot to any extent enter into it.

This way of making a qualitative stomach test is, on one hand, for the physician as well as for the patient, more simple and handy than that with the tube ; on the other, it does not cause any exertion to the patient, and even in ulcer of the stomach there is no danger whatever from a hemorrhage in consequence of the examination. For this reason this method seems to be especially recommended in all cases where there is suspicion of an ulcer of the stomach, and where one likes to avoid the tube. It is also appropriate to the general practitioner, who does not intend to make an exact analysis of the stomach-contents, but who merely desires to determine whether there exist free hydrochloric acid or not.<sup>2</sup> For a full exact analysis of the stomach-contents naturally the tube cannot be avoided.

The best time for obtaining a sample of the stomach-contents is, just as usual, one hour after Ewald's trial-breakfast, or three to four hours after a trial-dinner.

If the sample from the "stomach-bucket" give a positive reaction of hydrochloric acid (with Congo or Guenzburg's phloroglucin-vanillin test) then the same is made use of at once ; but should it prove negative as to the presence of hydrochloric acid the obtained sample must be examined more minutely, and if it is found to be mixed with much mucus then it is necessary to obtain another sample with capsule-covering, as described above.

This method of obtaining small samples of stomach-contents gives, besides this, the opportunity to examine

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<sup>1</sup> It happens but very seldom that the opening of the "bucket" becomes obstructed with some mucus of the stomach in such a way that no contents can enter into it ; then the trial must be repeated.

<sup>2</sup> The Stomach-bucket is manufactured by Messrs. J. Reynders & Co., 303 Fourth Avenue, New York.

several other points having reference to the œsophagus and the stomach, as for instance : 1, The permeability of the œsophagus ; 2, in extracting the apparatus, the determination whether the cardia is closed (in this case a certain resistance is felt, as soon as the vessel comes to the cardia), and then what distance there is from the cardia to the teeth ; 3, one is enabled, as soon as the "bucket" is in the stomach, to study partly the contractions of this organ, by observing how far, with what force, and at what intervals the thread is pulled farther in, for the thread *alone* affords too few supporting points to be moved by the contractions of the œsophagus. In this way every traction of the thread hints at a farther locomotion of the apparatus in the stomach.

These last points, however, I have studied too little as yet to be able to present you the value of such observations, but I hope, after numerous investigations, I may be able to do so. I would then feel honored, Mr. President and gentlemen, to impart to you the facts resulting from my experiments. This evening I would yet desire to demonstrate upon several patients the method described for obtaining stomach-contents.

[This lecture was then followed by the demonstration.]

122 EAST FIFTY-NINTH STREET.





